

4/9/4 (Item 4 from file: 155)  
 DIALOG(R)File 155:MEDLINE(R)

08467200 95241774 PMID: 7724816

Rapid MR imaging of the liver: comparison of twelve techniques for single breath-hold whole volume acquisition.

Naganawa S; Jenner G; Cooper T G; Potchen E J; Ishigaki T

Department of Radiology, Michigan State University, USA.

Radiation medicine (JAPAN) Nov-Dec 1994, 12 (6) p255-61, ISSN

0288-2043 Journal Code: 8412264

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Subfile: INDEX MEDICUS

Twelve magnetic resonance imaging pulse sequences for single breath-hold whole volume acquisition of the liver were evaluated on volunteers. Liver and spleen contrast to noise ratio (C/N), overall image quality, and grade of artifacts were compared. The 12 sequences included T2-weighted fast spin echo (FSE) with or without fat suppression (FS), fast multiplanar spoiled gradient recalled imaging (FMPSPGR), fast gradient recalled imaging without preparation pulses (FGR), FGR with inversion recovery preparation pulse nulling the liver or fat (IR-FGR-L and IR-FGR-F), FGR with driven equilibrium preparation pulse (DE-FGR), single shot moderately or heavily T2-weighted spin echo echo planar imaging (SE-EPI-mT2 and SE-EPI-hT2), multi-shot moderately T2-weighted spin echo echo planar imaging (multi-shot SE-EPI-mT2), inversion recovery EPI, and gradient echo EPI. In the quantitative analysis, FSE + FS showed a significantly higher C/N ratio than the others ( $p < 0.05$ ). In the qualitative evaluation, DE-prepFGR, and single and multi-shot SE-EPI-mT2 had good results, as did FSE and FSE + FS. Further studies should be conducted to determine whether or not these breath-hold sequences can obviate current conventional non-breath-hold sequences.

Tags: Comparative Study; Human

Descriptors: \*Liver--anatomy and histology--AH; \*Magnetic Resonance Imaging--methods--MT; Adipose Tissue; Artifacts; Echo-Planar Imaging --methods--MT; Image Enhancement--methods--MT; Image Processing,

4/9/8 (Item 2 from file: 34)  
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci  
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03572937 Genuine Article#: PN575 Number of References: 9  
Title: A NEW T-2 PREPARATION TECHNIQUE FOR ULTRAFAST GRADIENT-ECHO SEQUENCE  
Author(s): PARRISH T; HU XP  
Corporate Source: UMHC,DEPT RADIOL,BOX 292,420 DELAWARE ST  
SE/MINNEAPOLIS//MN/55455; UMHC,DEPT RADIOL/MINNEAPOLIS//MN/55455; UNIV  
MINNESOTA,CTR MAGNET RESONANCE RES/MINNEAPOLIS//MN/00000  
Journal: MAGNETIC RESONANCE IN MEDICINE, 1994, V32, N5 (NOV), P652-657  
ISSN: 0740-3194  
Language: ENGLISH Document Type: NOTE  
Geographic Location: USA  
Subfile: SciSearch; CC CLIN--Current Contents, Clinical Medicine  
Journal Subject Category: RADIOLOGY & NUCLEAR MEDICINE  
Abstract: The T-2 contrast in images obtained with **driven equilibrium** (90(x) degrees-180(x) degrees-90(x) degrees) prepared ultrafast gradient-echo sequences is compromised by the longitudinal magnetization build-up after the second 90(x) degrees pulse, which does not carry T-2 information. This paper describes a new T-2 contrast preparation technique for ultrafast gradient-echo sequence that suppresses the signal arising from the build-up. By dephasing in the preparation and rephasing in the acquisition of the gradient echoes, the new technique eliminates signals that are not dictated by the T-2 contrast in a **driven-equilibrium** approach. Consequently, it generates an image that is essentially T-2-weighted. Phantom and in vivo experiments were conducted to validate the technique and to demonstrate its clinical utility. These studies indicate that the technique works properly and can be used for in vivo studies.  
Descriptors--Author Keywords: ULTRAFAST GRADIENT-ECHO IMAGING ; T-2 WEIGHTING ; MAGNETIZATION PREPARATION  
Identifiers--KeyWords Plus: CONTRAST; MRI  
Research Fronts: 92-6417 001 (MR IMAGING; **FAST SPIN-ECHO PULSE SEQUENCES**; INTRACEREBRAL LESION CONTRAST)

4/9/7 (Item 1 from file: 34)  
 DIALOG(R)File 34:SciSearch(R) Cited Ref Sci  
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04250788 Genuine Article#: RR687 Number of References: 11  
 Title: HIGH-CONTRAST AND FAST 3-DIMENSIONAL MAGNETIC-RESONANCE-IMAGING AT  
 HIGH FIELDS

Author(s): LEE JH; GARWOOD M; MENON R; ADRIANY G; ANDERSEN P; TRUWIT CL;  
 UGURBIL K

Corporate Source: UNIV MINNESOTA,CTR MAGNET RESONANCE RES,SCH MED,385 E  
 RIVER RD/MINNEAPOLIS//MN/55455; UNIV MINNESOTA,CTR MAGNET RESONANCE  
 RES,SCH MED/MINNEAPOLIS//MN/55455; UNIV MINNESOTA,DEPT CHEM,DEPT  
 RADIOLOG/MINNEAPOLIS//MN/55455

Journal: MAGNETIC RESONANCE IN MEDICINE, 1995, V34, N3 (SEP), P308-312  
 ISSN: 0740-3194

Language: ENGLISH Document Type: NOTE

Geographic Location: USA

Subfile: SciSearch; CC CLIN--Current Contents, Clinical Medicine

Journal Subject Category: RADIOLOGY & NUCLEAR MEDICINE

Abstract: A new three-dimensional imaging strategy based on magnetization  
 prepared ultrafast gradient recalled echo technique that demonstrates  
 pronounced T-1 contrast at high fields is introduced, High-resolution  
 three-dimensional image sets of human brain showing high contrast  
 between white and gray matter areas are presented, The ratio of  
 contrast-to-noise was examined as a function of the relevant parameters  
 in the imaging sequence; calculations based on high-field T-1 values as  
 well as the experimental data demonstrated that maximal  
 contrast-to-noise ratio is attained under the same magnetization  
 preparation conditions both for cortical and subcortical gray matter  
 relative to white matter, leading to approximately equivalent  
 appearance of all gray matter areas in the same image. In addition, the  
 images displayed clear visualization of subtle anatomical structures  
 such as the subthalamic nuclei (ventral tier nuclei, dorsomedial  
 nucleus, and pulvinar) and mammillothalamic tracts.

Descriptors--Author Keywords: MRI ; PULSE SEQUENCES ; MODIFIED DRIVEN  
 EQUILIBRIUM FOURIER TRANSFORM ; HIGH T-1 CONTRAST

Identifiers--KeyWords Plus: NMR

Research Fronts: 93-2530 001 (T2-WEIGHTED FAST SPIN-  
 ECHO; GADOLINIUM-ENHANCED ENDORECTAL COIL MR IMAGING; STAGING  
 PROSTATIC-CANCER)

4/9/6 (Item 2 from file: 144)  
 DIALOG(R) File 144:Pascal  
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14393522 PASCAL No.: 00-0047642  
 T1- and T2-weighted imaging at 8 tesla : Ultra high field imaging  
 KANGARLU A; ABDULJALIL A M; ROBITAILLE P M L  
 Center for Advanced Biomedical Imaging, Department of Radiology, Ohio  
 State University, Columbus, OH, United States  
 Journal: Journal of computer assisted tomography, 1999, 23 (6) 875-878  
 ISSN: 0363-8715 CODEN: JCATD5 Availability: INIST-17761;  
 354000080411710090  
 No. of Refs.: 20 ref.  
 Document Type: P (Serial) ; A (Analytic)  
 Country of Publication: United States  
 Language: English  
 In this work, both T1- and T2-weighted fast imaging methods at 8 T are  
 presented. These include the modified **driven equilibrium**  
 Fourier transform (MDEFT) and rapid acquisition with relaxation enhancement  
 (RARE) methods, respectively. Axial MDEFT images were acquired with large  
 nutation angles, both partially suppressing gray and white matter and  
 permitting the visualization of vascular structures rich in unsaturated  
 spins. Sagittal RARE images, acquired from the same volunteer, were highly  
 T2-weighted, thus highlighting the CSF. At the same time, they provided  
 good visualization of the corpus callosum, cerebellum, and gray and white  
 matter structures. Importantly, both MDEFT and RARE images could be  
 acquired without violating specific absorption rate guidelines. Index  
 Terms: Magnetic resonance imaging, techniques-Fast spin  
 echo-Brain.

English Descriptors: Nuclear magnetic resonance imaging; Spin spin  
 relaxation; Spin lattice relaxation; Image quality; Brain (vertebrata);  
 Instruments; Central nervous system; Human; Fourier transformation;  
 Vascularization; Circulatory system; Anatomy; Spin echo  
 Broad Descriptors: Medical imagery; Imagerie medicale; Imageneria medical

4/9/3 (Item 3 from file: 155)  
 DIALOG(R) File 155:MEDLINE(R)

10443156 99434177 PMID: 10502758

MR imaging of articular cartilage using **driven equilibrium**.

Hargreaves B A; Gold G E; Lang P K; Conolly S M; Pauly J M; Bergman G; Vandevenne J; Nishimura D G

Department of Electrical Engineering, Stanford University, Stanford, California 94305-9510, USA. bah@stanford.edu

Magnetic resonance in medicine : official journal of the Society of Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine (UNITED STATES) Oct 1999, 42 (4) p695-703, ISSN 0740-3194

Journal Code: 8505245

Contract/Grant No.: CA509418; CA; NCI; HL56394; HL; NHLBI

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Subfile: INDEX MEDICUS

The high incidence of osteoarthritis and the recent advent of several new surgical and non-surgical treatment approaches have motivated the development of quantitative techniques to assess cartilage loss. Although magnetic resonance (MR) imaging is the most accurate non-invasive diagnostic modality for evaluating articular cartilage, improvements in spatial resolution, signal-to-noise ratio (SNR), and contrast-to-noise ratio (CNR) would be valuable. Cartilage presents an imaging challenge due to its short T(2) relaxation time and its low water content compared with surrounding materials. Current methods sacrifice cartilage signal brightness for contrast between cartilage and surrounding tissue such as bone, bone marrow, and joint fluid. A new technique for imaging articular cartilage uses **driven equilibrium** Fourier transform (DEFT), a method of enhancing signal strength without waiting for full T(1) recovery. Compared with other methods, DEFT imaging provides a good combination of bright cartilage and high contrast between cartilage and surrounding tissue. Both theoretical predictions and images show that DEFT is a valuable method for imaging articular cartilage when compared with spoiled gradient-recalled acquisition in the steady state (SPGR) or **fast spin echo** (FSE). The cartilage SNR for DEFT is as high as that of either FSE or SPGR, while the cartilage-synovial fluid CNR of DEFT is as much as four times greater than that of FSE or SPGR. Implemented as a three-dimensional sequence, DEFT can achieve coverage comparable to that of other sequences in a similar scan time. Magn Reson Med 42:695-703, 1999. Copyright 1999 Wiley-Liss, Inc.

Tags: Human; Support, Non-U.S. Gov't; Support, U.S. Gov't, P.H.S.

Descriptors: \*Cartilage, Articular--anatomy and histology--AH; Fourier Analysis; Knee Joint; Magnetic Resonance Imaging--methods--MT

4/9/2 (Item 2 from file: 155)  
 DIALOG(R)File 155:MEDLINE(R)

10872375 20432433 PMID: 10975883

Interactive **fast spin-echo** imaging.  
 Busse R F; Riederer S J; Fletcher J G; Bharucha A E; Brandt K R  
 Magnetic Resonance Laboratory, Mayo Clinic, Rochester, Minnesota, USA.  
 Magnetic resonance in medicine : official journal of the Society of  
 Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine  
 (UNITED STATES) Sep 2000, 44 (3) p339-48, ISSN 0740-3194  
 Journal Code: 8505245

Document type: Clinical Trial; Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Subfile: INDEX MEDICUS

It is shown that a spin-echo sequence may be used to acquire T(2)-weighted, high-resolution, high-SNR sections at quasi-real-time frame rates for interactive, diagnostic imaging. A single-shot **fast spin-echo** sequence was designed which employs **driven equilibrium** to realign transverse magnetization remaining at the final spin echo. **Driven equilibrium** is shown to improve T(2) contrast at a given TR, or conversely to reduce TR by approximately 1000 msec and thus increase temporal resolution while maintaining a given level of contrast. Wiener demodulation of k-space data prior to reconstruction is shown to reduce blurring caused by T(2)-decay while constraining noise often associated with other inverse filters. Images are continuously acquired, reconstructed, and displayed at rates of one image every one to two seconds, while section position and contrast may be altered interactively. The clinical utility of this method is demonstrated with applications to dynamic pelvic floor imaging and interactive obstetric imaging.

Tags: Female; Human; Pregnancy

Descriptors: \*Facial Neoplasms--diagnosis--DI; \*Fetal Diseases--diagnosis--DI; \*Image Enhancement--methods--MT; \*Magnetic Resonance Imaging--methods--MT; \*Pregnancy Complications, Neoplastic--diagnosis--DI; \*Signal Processing, Computer-Assisted; Computer Systems; Facial Neoplasms--embryology--EM; Gels--analysis--AN; Magnetic Resonance Imaging, Cine--methods--MT; Models, Theoretical; Pelvic Floor--pathology--PA; Phantoms, Imaging; Plant Oils--analysis--AN; Prenatal Diagnosis; Rectocele--diagnosis--DI; Water--analysis--AN

4/9/5 (Item 1 from file: 144)  
DIALOG(R)File 144:Pascal  
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15187360 PASCAL No.: 01-0352470  
Cervical spine: Three-dimensional **fast spin-echo MR**  
imagingimproved recovery of longitudinal magnetization with **driven**  
**equilibrium** pulse  
MELHEM Elias R; ITOH Ryuta; FOLKERS Paul J M  
Department of Radiology and Radiological Sciences, Johns Hopkins Medical  
Institutions, 600 N Wolfe St, Baltimore, MD 21287, United States; Philips  
Medical Systems, Best, Netherlands  
Journal: Radiology, 2001, 218 (1) 283-288  
ISSN: 0033-8419 CODEN: RADLAX Availability: INIST-6163;  
354000096566960460  
No. of Refs.: 22 ref.  
Document Type: P (Serial) ; A (Analytic)  
Country of Publication: United States  
Language: English

English Descriptors: Cervical spine; Echography; Nuclear magnetic resonance  
imaging; Three dimensional field; Technique; Human  
Broad Descriptors: Sonography; Medical imagery; Exploration ultrason;  
Imagerie medicale; Exploracion ultrasonido; Imageneria medical  
French Descriptors: Rachis cervical; Echographie; Imagerie RMN; Champ  
tridimensionnel; Technique; Homme

Classification Codes: 002B24A07

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3/TI,PN,PD,AN,AD,IC,AB,PA,K/1 (Item 1 from file: 349)  
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ASSESSING THE CONDITION OF A JOINT AND DEVISING TREATMENT  
 EVALUATION DE L'ETAT D'UNE ARTICULATION ET TRAITEMENT AFFERENT

Patent Applicant/Assignee:

LELAND STANFORD JUNIOR UNIVERSITY, Suite 350, 900 Welch Road, Palo Alto,  
 CA 94304, US, US (Residence), US (Nationality), (For all designated  
 states except: US)

Patent Applicant/Inventor:

ALEXANDER Eugene J, 573 Lytton Apt. D, Palo Alto, CA 94301, US, US

Patent and Priority Information (Country, Number, Date):

Patent: WO 200222014 A1 20020321 (WO 0222014)

Application: WO 2001US28680 20010914 (PCT/WO US0128680)

Main International Patent Class: A61B-005/055

International Patent Class: A61B-005/103

English Abstract

Methods are disclosed for assessing the condition of a cartilage in a joint, particularly a human knee. The methods include converting an image such as an MRI to a three dimensional map of the cartilage. The cartilage map can be correlated to a movement pattern of the joint to assess the affect of movement on cartilage wear. Changes in the thickness of cartilage over time can be determined so that therapies can be provided. Information on thickness of cartilage and curvature of cartilage or subchondral bone can be used to plan therapy. Information on movement pattern can be used to plan therapy.

Claim

... are then mathematically integrated to give a threedimensional image.

33 The method of Claim 32, wherein the MRI technique employs a gradient echo, spin echo, **fast-spin echo, driven equilibrium** Fourier transform, or spoiled gradient echo technique.

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ASSESSING CONDITION OF A JOINT AND CARTILAGE LOSS  
 EVALUATION DE L'ETAT D'UNE ARTICULATION ET D'UNE PERTE DE CARTILAGE

Patent Applicant/Assignee:

LELAND STANFORD JUNIOR UNIVERSITY, Suite 350, 900 Welch Road, Palo Alto,  
 CA 94304, US, US (Residence), US (Nationality)

Patent and Priority Information (Country, Number, Date):

Patent: WO 200222013 A1 20020321 (WO 0222013)

Application: WO 2001US28679 20010914 (PCT/WO US0128679)

Main International Patent Class: A61B-005/055

International Patent Class: A61B-005/103

English Abstract

Methods are disclosed for assessing the condition of a cartilage in a joint and assessing cartilage loss, particularly in a human knee. The methods include converting an image such as an MRI to a three dimensional map of the cartilage. The cartilage map can be correlated to a movement pattern of the joint to assess the affect of movement on cartilage wear. Changes in the thickness of cartilage over time can be determined so that therapies can be provided. The amount of cartilage tissue that has been lost, for example as a result of arthritis, can be estimated.

Claim

... then mathematically integrated to give a three dimensional image.

9 The method of Claim 7, wherein the MRI technique employs a gradient echo, spin echo, **fast-spin echo, driven equilibrium** fournier transform, or spoiled gradient echo technique.

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. A method of assessing cartilage disease or damage in a joint comprising cartilage and accompanying bone on...

3/TI,PN,PD,AN,AD,IC,AB,PA,K/3 (Item 3 from file: 349)  
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ASSESSING THE CONDITION OF A JOINT AND PREVENTING DAMAGE  
 ESTIMATION DE L'ETAT D'UNE ARTICULATION ET PREVENTION DE LESIONS

Patent Applicant/Assignee:

STANFORD UNIVERSITY,  
 ALEXANDER Eugene J,  
 ANDRIACCHI Thomas P,  
 LANG Philipp,  
 NAPEL Sandy A,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200035346 A2 20000622 (WO 0035346)

Application: WO 99US30265 19991216 (PCT/WO US9930265)

Main International Patent Class: A61B-005/11

English Abstract

Methods are disclosed for assessing the condition of a cartilage in a joint, particularly a human knee. The methods include converting an image such as an MRI to a three dimensional map of the cartilage. The cartilage map is then correlated to a movement pattern of the joint to assess the affect of movement on cartilage wear. Reference markers useful in obtaining internal images of the cartilage and bone and external images of the limbs in a motion are described. The markers aid in correlating the various images. Changes in the thickness of cartilage over time can be determined so that therapies can be provided.

Claim

... then mathematically integrated to give a three-dimensional image.

21 The method of Claim 15 wherein the MRI technique employs a gradient echo, spin echo, **fast-spin echo, driven equilibrium** fournier transform, or spoiled gradient echo technique.

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SUBSTITUTE SHEET (RULE 26)

. The method of Claim 1 1 wherein the movement pattern and the cartilage ...then mathematically integrated to give a three-dimensional image.

44 The method of Claim 38 wherein the MRI technique employs a gradient echo, spin echo, **fast-spin echo, driven equilibrium** fournier transform, or spoiled gradient echo technique.

45 The method of Claim 34 wherein the movement pattern and the cartilage degeneration pattern are merged to...

...then mathematically integrated to give a three-dimensional image.

69 The method of Claim 63 wherein the MRI technique employs a gradient echo, spin echo, **fast-spin echo, driven equilibrium** fournier transform, or spoiled gradient echo technique.

70 The method ...are then mathematically integrated to give a three-dimensional image.

88 The method of Claim 72 wherein the MRI employs a gradient echo, spin echo, **fast-spin echo, driven equilibrium** fournier transform, or spoiled gradient echo technique.

89 The method of Claim 72 wherein the surface contact pattern in the joint and the geometrical representation...are then mathematically integrated to give a three-dimensional image. 107. The method of Claim 91 wherein the MRI employs a gradient echo, spin echo, **fast-spin echo, driven equilibrium** fournier transform, or spoiled gradient echo technique.

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SUBSTITUTE SHEET (RULE 26)

. The method of Claim 91 wherein the load pattern of the articular cartilage...

...then mathematically integrated to give a three-dimensional image. 127.

19nov02 16:33:43 User259284 Session D2018.3

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Set	Items	Description
S1	202	{DRIV??? (2N)EQUILIBRI????}
S2	5655	{FSE OR FAST()SPIN()ECHO????}
S3	0	1AND2

19nov02 16:30:18 User259284 Session D2018.2

SYSTEM:OS - DIALOG OneSearch

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File 349:PCT FULLTEXT 1979-2002/UB=20021114,UT=20021107

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Set	Items	Description
S1	105	(FSE OR FAST() SPIN() ECHO???) /TI,CM,AB
S2	35	(DRIV??? (2N) EQUILIBRI???) /TI,CM,AB
S3	3	1AND2

19nov02 16:25:17 User259284 Session D2018.1

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File 144:Pascal 1973-2002/Nov W3

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File 105:AESIS 1851-2001/Jul

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\*File 105: This file is closed (no updates)

File 99:Wilson Appl. Sci &amp; Tech Abs 1983-2002/Oct

(c) 2002 The HW Wilson Co.

File 58:GEOARCHIVE 1974-2002/NOV

(c) 2002 Geosystems

\*File 58: UD=200211 includes updates for July-November.

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File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec

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File 65:Inside Conferences 1993-2002/Nov W3

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File 350:Derwent WPIX 1963-2002/UD,UM &amp;UP=200273

(c) 2002 Thomson Derwent

\*File 350: Alerts can now have images sent via all delivery methods. See HELP ALERT and HELP PRINT for more info.

File 347:JAPIO Oct 1976-2002/Jul (Updated 021104)

(c) 2002 JPO &amp; JAPIO

\*File 347: JAPIO data problems with year 2000 records are now fixed. Alerts have been run. See HELP NEWS 347 for details.

Set	Items	Description
S1	7084	FSE OR FAST()SPIN()ECHO???
S2	1811	DRIV???(2N)EQUILIBRI???

S3	24	1AND2
S4	8	RD S3 (unique items)
S5	336	AU=SHENOY R?
S6	8	AU=DAMADIAN J?
S7	218	AU=SHENOY, R?
S8	0	AU=DAMADIAN, J?
S9	0	(S5 OR S7) AND (S6 OR S8)
S10	89	PA=FONAR?
S11	130	CS=FONAR?
S12	758	S5:S11
S13	0	1AND12
S14	0	2AND12
? b 348,349		